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Suppurative Disease of the Accessory Sinuses of the Nose.

BY

HERBERT MAXON KING, M. D.,

GRAND RAPIDS, MICH.,

Formerly Instructor in Diseases of the Throat and Nose in the New York Post-Graduate Medical School.

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SUPPURATIVE DISEASE OF THE ACCESSORY SINUSES OF THE NOSE.*

By HERBERT MAXON KING, M. D.,
GRAND RAPIDS, MICH.,
FORMERLY INSTRUCTOR IN DISEASES OF THE THROAT AND NOSE IN THE NEW YORK POST-GRADUATE MEDICAL SCHOOL.

A CHRONIC, purulent discharge from the nares, associated with little or no fœtor perceptible to the attendant, with a history of nasal polypi, an acute "head cold," hypertrophic nasal catarrh, or perhaps of alveolar abscess, at a period more or less remote, has, comparatively speaking, only recently and with the development of the study of rhinology been of any special significance to the surgeon.

With the evolution of the specialist, however, classification of diseases of the special organs on more scientific bases was soon followed by a clearer comprehension of the nature of a morbid condition of which such a discharge is the evidence, and in many instances the only evidence, at the command of the physician.

Treatises on general surgery, as found in many of our libraries, contain very little that is of practical value upon

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the subject, and even those more recent and exhaustive works upon rhinology and laryngology which have appeared within the last decade give comparatively little space to the discussion of the ætiology, pathology, and treatment of a morbid condition the importance, the consequences, and the extreme obstinacy in resisting cure of which can only be estimated by those who, like myself, have often seen their best efforts vainly directed, and that with perfect cognizance of the existing condition, toward their relief.

That empyema of these sinuses is not an infrequent complication I am assured as well from the number I have myself seen as from the reports of others, and yet I am convinced that it is less often recognized and correctly differentiated than almost any other disease of the nasal tract.

Garretson (*System of Oral Surgery*) draws the conclusion that "diseases of the antrum are for the most part simple in character, easy of diagnosis, and, as a rule, not at all difficult of treatment." This conclusion is very misleading, and I think will be borne out only by the experience of the oral surgeon and not by that of the rhinologist, for reasons at once patent—the former, as a rule, coming in contact with those cases arising from caries of the teeth alone, and that during or very early subsequent to the acute stage, while the latter has to deal with those arising primarily in the cavity or from a diseased condition in the nares as well, and, as a rule, is consulted only after chronicity is well established, the history often indefinite and merging into that of polypus or hypertrophic catarrh, and without those perfectly clear, ætiological landmarks which present to the former. Now, if this be true of the antrum, the largest and most commonly affected of all the accessory cavities, it applies with much greater force to that condition affecting the frontal and

sphenoidal sinuses and the ethmoidal cells. When these cavities are affected it is by no means an easy matter to correctly diagnosticate the case, and still less so to successfully treat it.

In the first place, this condition of empyema, simulating as it does in its morbid products an abscess, is in every other respect analogous to a "gleet"—an idea suggested by Mr. Bell and quoted by Dr. Garretson, who says in making the comparison: "Both diseases consist equally of an altered secretion, in one case of the pituitary membrane, and in the other of the muscular lining of the urethra, which in neither instance possesses any of the characteristics of abscess, though the matter in both is purulent."

In this respect does empyema of these sinuses differ from suppurative disease of the mastoid cells. In the former it is the normal secretion which is altered, a mere perversion of function, and that often before any structural lesion can be determined to exist.

I do not mean that exfoliation, ulceration, caries, and necrosis may not occur in the course of a long-standing empyema in these cavities, for it often, I might almost say invariably, does occur unless relief is effected; but it is the effect and not the cause of the continued suppuration, as is the case in mastoid complications of middle-ear difficulty.

Reviewing what has been written upon the ætiology, we find a somewhat startling discrepancy of opinion even among contemporaries with equal opportunities for observation. All agree, however, that the disease in question is almost without exception secondary to one or more of three conditions—viz.: (1) Disease of the teeth or surrounding structures; (2) disease of the nasal chamber proper; or (3) a constitutional condition which predisposes to erosions of mucous surfaces throughout the body, but especially those of the upper air-passages. Cases arising from this last

cause form such a small proportion of those which come under our observation, besides being of such minor importance when considered in the light of the more grave and serious symptoms manifest in these conditions, that they will not be considered in this article. We are then reduced to the two classes of causes as above first mentioned. Which of these is the most frequent it seems to be impossible to decide, where reference is had to the antrum, when observers of such unquestionable experience and integrity as Bosworth, Fraenkel, Zuckerkandl, and Christopher Heath disagree, Bosworth and Zuckerkandl finding nasal lesions most often the cause, while Fraenkel and Christopher Heath are able to attribute the greater number to dental caries. In an analysis of thirty-one cases, Kuchenbecker found thirty-three per cent. to be due to dental caries, twenty-two per cent. to general diseases, ten per cent. to tumors, twenty-two per cent. to unknown causes, while but thirteen per cent. could be attributed to causes arising within the nose. (Burnett, *System of Diseases of the Ear, Nose, and Throat.*)

The proportion here attributed to general diseases seems to me extraordinarily large, likewise the number for which no cause could be found; but that it is often impossible to determine which of two existing lesions—dental caries or hypertrophied and degenerated turbinated tissues—is the primary cause of pus secretion in the antrum, I am very well aware.

That empyema of the antrum may supervene upon a catarrhal inflammation in the nares without other factors in its causation is no doubt possible under two conditions—*i. e.*, (1) there must be an extension or a coexistence of the catarrhal inflammation in the lining membrane of the antrum, exciting secretion in excess of what can be absorbed by the lymphatics, and (2) there must be an occlusion of

the ostium maxillare of sufficient duration for the accumulation and decomposition of the secretion, which may then, by the irritation of its presence, excite a further discharge which finally becomes purulent. The natural opening of this sinus into the meatus is so situated as to be protected from occlusion by any save the most aggravated cases of hypertrophic rhinitis, which fact may explain the infrequency of antral complications in our recent epidemics of influenza, where undoubtedly the lining membrane of the accessory sinuses was often affected simultaneously with that of the nasal chambers by the common infecting agent.

In the case of polypus and polypoid hypertrophy, on the other hand, the respective openings of these cavities may become occluded; in fact, rarely is it otherwise in neglected cases. But unless the growth projects into the cavity, and by irritation of its presence causes supersecretion, which degenerates into a purulent discharge, the function of the lymphatics prevents empyema.

My own experience, together with what I have been able to glean from reports extant upon the subject, convinces me that suppurative disease of the antrum is of very much more frequent occurrence than that of all the other accessory cavities put together, but I can not well see why the antrum should be more often affected by causes arising within the nose than should the other sinuses, subjected as they are to identical influences so far as the nose is concerned; and it is the consideration of these facts, supported by my experience in these complications, which strongly inclines me to the belief that to diseases of the teeth and surrounding structures we must look for the most frequent causes of empyema of the antrum, while to intranasal disease in the majority of instances may be attributed a like condition occurring in the other accessory cavities.

The importance of early recognizing the exciting cause of the disease in question can not be overestimated by one who expects success to attend his efforts toward a cure. The diagnosis of empyema of the accessory sinuses when but one cavity or but one side is affected and in typical cases seen early is not difficult; but typical cases are not the rule, and it is seldom that the advice of the surgeon is sought before chronicity has complicated the primary lesion with its confusing sequelæ, and then it is that diagnosis will often of necessity sink to the level of mere conjecture.

The Voltolini method of transillumination by means of a small incandescent lamp promised much toward making diagnosis in these cases easy, but I must confess that I have not found it a very reliable test, except in demonstrating the presence of pus in the frontal sinuses. Where the ethmoidal cells and maxillary sinuses are suspected it has been of little value in my hands, and, to be brief, a chronic purulent discharge from the nares, more or less profuse, especially if it be unilateral and we can eliminate syphilis, foreign body, neoplasm, and simple purulent rhinitis, rarely if ever seen in adult life, is a sufficiently suspicious sign to warrant us in taking the only step which will make the diagnosis absolutely correct—namely, abstracting pus from the suspected cavity. This may be effected by means of small aspirators constructed of proper shape and strength in the case of any of the cavities in question except the frontal sinuses, without excessive pain and with little or no danger of untoward results if the suspected cavity should prove healthy. In the instance of the frontal sinus being suspected, provided I could not otherwise differentiate, I should not hesitate to make an incision through the skin and enter the sinus with a small Curtiss trephine or drill, as in the case reported below, convinced as I am that if the frontal sinus is affected this procedure results in most rapid cure, with the

least inconvenience to the patient, while if it should by any chance not be diseased the wound heals with an almost imperceptible scar. It is hardly necessary to say that where suspicion falls upon the antrum and a carious tooth exists upon the affected side, removal of the diseased tooth, especially should it chance to be a first molar or second bicuspid, is the indication, when, if this alone does not affect an entrance, it is a very easy matter to do so through the alveolus; should the teeth be perfectly sound, however, I should aspirate through the thin lateral wall of the nose as low down as the floor of the inferior meatus with a strong curved trocar.

Upon the establishment of the diagnosis, relative to the ætiology in these cases, will depend, to a certain extent, the prognosis, although it has been my misfortune to see a number of cases continue indefinitely and with only slight improvement after every vestige of the primary cause was removed, as in the third case reported below.

On one point with reference to prognosis I think all observers agree—*i. e.*, spontaneous resolution never occurs in these cases when the cause is attributable either to lesions within the nasal chambers or to those connected with the teeth.

Moreover, when once the antrum has been the seat of an empyema for any considerable time, and especially if drainage has been established through any but the normal opening, I believe it to be extremely doubtful that it can ever again resume its normal condition and manner of evacuation; the prolonged contact with pus so disturbing or destroying the cilia of the epithelium as to make the discharge of their function impossible. With regard to the other sinuses this does not apply, since gravitation alone is a force sufficient to effect drainage, provided the normal outlets are patent.

But here, also, a successful issue of the case is often long delayed, and the prognosis as to complete restoration a matter of great uncertainty, unless a cure is attempted by radical operation.

Of the treatment of this affection I can say very little that is not better illustrated in my reports of the three cases cited below, which I have selected for the very reason that they embrace about all that I have found to be beneficial in the matter of treatment, and that, as will be seen, is not such as to warrant me in any great amount of self-glorification.

Case I.—A woman, sixty-seven years of age, came to the "throat clinic" of the New York Post-graduate School and Hospital late in the summer of 1889, complaining of a profuse purulent discharge from the nares, which was attributed to "chronic catarrh," for which she had been treated for nearly two years; the discharge amounting at times to a teacupful in twenty-four hours. The patient was somewhat emaciated and very anæmic. Examination revealed a large quantity of laudable pus within the nares—more in the right than in the left, but present in both—removal of which was soon followed by reappearance in the right middle meatus. Leaning toward the left side rapidly filled the right naris and more slowly the left. The turbinated tissues were anæmic, otherwise normal, while the cartilaginous sæptum was perforated. Examination of the mouth discovered an apparently healthy state of the alveolar ridge. The patient had worn a full plate of artificial teeth for ten years. The question lay between empyema of the antrum and that of the ethmoidal cells. I decided to eliminate antral disease, and accordingly entered the antrum from the alveolar ridge in about the location of the first molar with a small Curtiss nasal trephine. A large quantity of slightly malodorous pus immediately followed the withdrawal of the instrument. The cavity was then washed out with a carbolized solution and explored with a probe. A hard, movable body was discovered, attached by soft tissues to the floor of the antrum. The opening

was then enlarged to admit of the extraction of what proved to be a portion of the root of a tooth which had doubtless been as a foreign body within the antrum for the space of ten years or more. My prognosis was favorable to rapid recovery. Subsequent treatment by flushing the cavity daily with a borate-of-sodium solution, and the use of peroxide of hydrogen (an agent which I have since entirely abandoned in such cases), reduced the discharge to a muco-pus, which was evacuated through a metal drainage-tube, attached to the dental plate, in quantities varying from half an ounce to an ounce daily. The nasal discharge ceased at once. I saw the patient six months later and her condition was unchanged, save that the artificial opening into the antrum had become permanent, and the metal tube had been discarded. She was in the habit of douching the antrum every day with a solution of boric acid.

Case II.—In the early fall of 1882 I was called to see a patient suffering from influenza, then epidemic—a woman, thirty-two years old, of previous good health. There was nothing unusual about the case, save a persistent and severe congestion of the pituitary membrane, which failed to react even to cocaine. The usual headache accompanying grippe was in this instance particularly severe, and morphine was used to control the pain. At the end of a fortnight the parts had somewhat regained a normal appearance, and a discharge, at first of muco-pus, afterward of a thick yellow pus, supervened. Otherwise there were no complications in the case. A treatment of detergent and antiseptic sprays and douching by means of a modified Eustachian catheter for several months seemed to have little or no curative effect. Up to this time the patient had suffered no pain or discomfort, save from the discharge of pus, which at times was very profuse. Suddenly, in the early part of December, I was called to attend the patient at her house. I found her suffering from excruciating frontal headache; the discharge from the nares had ceased. The use of a strong solution of cocaine reduced the turgescent tissues temporarily, re-established the discharge, and relieved the pain somewhat. There was no displacement of the eyeball, nor swelling or redness at the inner angles of the orbits, and

after draining the cavities as well as I could, and cleansing the nares with an antiseptic solution, I left the patient in comparative comfort. Late on the same night I was again called and found the patient with a temperature of 103° F., a very rapid pulse, and intervals of delirium. I had from the first diagnosticated the case as empyema of the frontal sinuses (double), and I now believed the symptoms present to be due to pressure upon the brain structures, caused by the accumulation of pus within the sinuses and the occlusion of one or both ostia. Although even at this time there was not the usual bulging at the inner angles of the orbits, I regarded the case as an emergency, and determined to open the sinuses without delay. Sending for my surgical engine and set of drills, I at once made the incisions on a line with, and a little below, the supra-orbital ridges, from about a quarter of an inch on either side of the median line, an inch in either direction; then, by means of a drill, I opened through to both sinuses, and had the satisfaction of evacuating a greater quantity of pus than it would be imagined these sinuses could contain. Relief from the untoward symptoms almost immediately followed, and the following day (under chloroform) I curetted the cavities, scraping away considerable necrosed bone. The treatment and dressings subsequently were what would be indicated in any like instance, and there was complete recovery within three weeks, with by no means an unsightly disfigurement.

Case III.—In December, 1892, I was consulted by a gentleman about forty-five years of age. The history of this case was, in brief, as follows:

About three years and a half before consulting me the patient had suffered from alveolar abscess of the first left molar. Upon extraction, an abscess sac was discovered upon one of the fangs. Within twenty-four hours after extraction a profuse discharge of pus occurred and persisted from the left naris. An incision was then made through the alveolus, followed by a purulent discharge, which continued as long as the opening thus made was patent.

It seems worthy of note in this case that disease of the walls of the antrum was not the result of extension through continui-

ty of structure, but through mere contiguity of a pathological condition.

In July, a month following the first appearance of the purulent discharge from the nose, the patient went to Detroit, where an opening (under chloroform) was made into the antrum in the region of the canine fossa. A glass drainage tube was inserted, through which the patient was directed to inject a solution of peroxide of hydrogen once or twice daily. A year later, while in Philadelphia, he was advised to discontinue the peroxide of hydrogen and substitute a carbolized solution. This treatment had been continued, with some variation, from time to time up to the date of my first attending him.

I found a discharge from the left naris of laudable pus sufficient to soil three or four handkerchiefs daily. The ostium maxillare was perfectly patent, and the condition of the turbinated tissues was normal. There existed an antral fistula through the alveolus, so small as to admit only the smallest probe, but no pus was discharged by it. I enlarged the opening in the alveolus by means of a drill, evacuating a large quantity of pus, and, after thoroughly cleansing the antrum, examined the interior with a probe. I found it partly divided into two chambers by a thin sæptum of bone, which I broke down with an abscess curette. The treatment then consisted in frequent douchings with solutions of boric acid (saturated), carbolic acid (two per cent.), and bichloride of mercury (not stronger than 1 to 10,000), which was continued, more or less regularly, for a year, with but one advantage gained—viz., the discharge from the nose entirely ceased, and that through the fistula was reduced in quantity. Early this year an examination with a probe detected what seemed to me to be a disease at the root of the wisdom tooth, the only remaining molar on that side of the arch. Upon extraction an abscess sac was found upon the root, which had extended into the antrum; removal of the tooth effected another opening through the floor of the antrum, and with the free drainage thus established I hope for early recovery. For nearly a month I treated the case much as before, reducing the discharge considerably, but not entirely.

I might add that at this time I resorted, without appreciable

results, to the use of tincture of iodine, at first half diluted and afterward full strength; also to solution of silver nitrate, fifteen grains to the ounce, and tincture of chloride of iron, diluted one half. I then tried the so-called "dry treatment," which consisted in thorough cleansing with a syringe and Eustachian catheter adapted to fit the fistulous opening, and an antiseptic solution; then evaporating the moisture from the walls of the antrum by injecting a current of air through the same by means of a Politzer bag until dryness is obtained. I then insufflated impalpable powder (boric acid, stearate of zinc with europhen, stearate of mercury, or tannin).

I saw the case last Monday, and there was still a purulent discharge through the alveolar fistula (which, by the way, has at no time shown a disposition to close)—not at all profuse or annoying in comparison to what it had been, but still the result has been less satisfactory than I had hoped or expected it to be.

In conclusion, I will only say that my experience with these cases has led me to entertain rather pessimistic views as to their ever yielding perfectly satisfactory results, unless seen early in their course, before chronicity is established, and even then when the treatment is more radical than we have been in the habit of employing.

86 Jefferson Avenue.